LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-17. (Canceled)

18. (Previously Presented) A multimode optical fiber that favors lower order modes, the fiber comprising:

a core having a longitudinal optical axis and incorporating radially dependent amounts of dopant material and selected transparent oxides that are selected to provide a measure of independent control over both a desired refractive index profile and a desired radially dependent Raman gain coefficient profile that favors lower order modes and discriminates against higher order modes, the refractive index and the Raman gain coefficient have their highest values along the optical axis of the fiber; and

a cladding region surrounding the core and having a refractive index different from that of the core material;

wherein light launched into an end of the fiber is subject to higher Raman gain along the optical axis, which promotes lower order modes and discriminates against higher order modes.

19. (Previously Presented) A multimode optical fiber as defined in claim 18, wherein the dopant that affects the Raman gain coefficient is germanium oxide.

20. (Previously Presented) A multimode optical fiber as defined in claim 18, wherein the refractive index profile and the Raman gain coefficient profile both have a generally parabolic shape with a peak coinciding with the optical axis of the fiber.

21. (Previously Presented) A multimode optical fiber as defined in claim 18, wherein the radially dependent amounts of dopant materials comprise a minimum amount of dopant material

near an interface between the core and the cladding region with a gradual transition to a maximum amount at the optical axis.

22. (Previously Presented) A multimode optical fiber as defined in claim 18, wherein the fiber is configured to provide higher Raman gain along the optical axis for multimode light launched into the fiber.

23. (Previously Presented) A Raman laser oscillator, comprising:

a multimode optical fiber that favors lower order modes, the fiber comprising a core having a longitudinal optical axis and incorporating radially dependent amounts of dopant materials and selected transparent oxides that are selected to provide a measure of independent control over both a desired refractive index profile and a desired Raman gain coefficient profile that favors lower order modes and discriminates against higher order modes, and a cladding region surrounding the core and having a refractive index different from that of the core material, the refractive index and the Raman gain coefficient have their highest values along the optical axis of the fiber;

a diode laser array providing pump power to the laser oscillator;

means for launching the pump power into the fiber; and

reflective means defining a laser cavity encompassing the fiber;

wherein light launched into the fiber is subject to higher Raman gain along the optical axis, which promotes lower order modes and discriminates against higher order modes.

24. (Previously Presented) A Raman laser oscillator as defined in claim 23, wherein the refractive index profile and the Raman gain coefficient profile both have a generally parabolic shape with a peak coinciding with the optical axis of the fiber.

25. (Previously Presented) A Raman laser oscillator as defined in claim 23, wherein the reflective means comprises a highly reflective mirror positioned at one end of the fiber and a partially transmitting mirror at the other end of the fiber.

26. (Previously Presented) A Raman laser oscillator as defined in claim 23, wherein:

the reflective means comprises a highly reflective mirror at one end of the fiber and a partially transmitting mirror; and

the oscillator further comprises optical means for receiving light emitted from the other end of the fiber and transmitting a generally collimated beam to the partially transmitting mirror.

27. (Previously Presented) A Raman laser oscillator as defined in claim 26, wherein the optical means comprises multiple lenses and a pinhole filter.

28. (Previously Presented) A Raman laser oscillator as defined in claim 23, wherein the radially dependent amounts of dopant materials comprise a minimum amount of dopant material near an interface between the core and the cladding region with a gradual transition to a maximum amount at the optical axis.

29. (Previously Presented) A Raman laser oscillator as defined in claim 23, wherein the fiber is configured to provide higher Raman gain along the optical axis for multimode light launched into the fiber.

30. (Previously Presented) A method of generating a diffraction limited high brightness laser beam in a multimode fiber, the method comprising:

providing a multimode fiber having a core with radially dependent amounts of dopant materials and selected transparent oxides that are selected to provide a measure of independent control over both a refractive index profile and a Raman gain index profile with maxima coinciding with an optical axis of the fiber;

generating high brightness pump power in a laser diode array;

launching the pump power into one end of the multimode fiber;

in the fiber, favoring the lowest order mode by providing maximum Raman gain along the optical axis, and discriminating against higher order modes;

providing a laser cavity that encompasses the multimode fiber; and

outputting a diffraction limited high brightness beam from the laser cavity.

31. (Previously Presented) The method of claim 30, wherein launching the pump power into one end of the multimode fiber comprises launching a multimode laser input into one end of the multimode fiber.

32. (Previously Presented) The method of claim 30, further comprising incorporating a minimum amount of dopant material near an interface between the core and a cladding region with a gradual transition to a maximum amount at the optical axis.

33. (New) A multimode optical fiber as defined in claim 18, wherein the core comprises a single core region incorporating both the radially dependent amounts of dopant material and the selected transparent oxides at each given radius from the longitudinal optical axis.